This listing of claims will replace all prior versions, listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A hybrid porous material having a porous framework material and pre-selected organic, organometallic, or biological molecules chemically attached to a surface of walls of pores of the porous framework through two or more chemical linkages.

2. (original) The material according to claim 1 in which the porous framework material is a porous metaloxide.

3. (original) The material according to claim 1 in which the porous framework material is a mesoporous metaloxide.

4. (original) The material according to claim 1 in which the porous framework material is a macroporous metaloxide.

5. (original) The material according to claim 1 in which the porous framework material is a mesoporous-macroporous metaloxide.

6. (previously presented) The material according to claim 2 in which the metaloxide is silica.

7. (previously presented) The material according to claim 2 in which the metaloxide is selected from the group consisting of oxides of boron, magnesium, aluminum,

gallium, germanium, tin, titanium, zirconium, niobium, tantalum, molybdenum, tungsten and mixed metals.

8. (original) The material according to claim 1 in which the porous framework material is a porous organometaloxide.

9. (original) The material according to claim 8 in which the porous organometaloxide is a mesoporous organometaloxide.

10. (original) The material according to claim 8 in which the porous organometaloxide is a macroporous organometaloxide.

11. (original) The material according to claim 8 in which the porous organometaloxide is a mesoporous-macroporous organometaloxide.

12. (previously presented) The material according to claim 8 in which the organometaloxide is organosilica.

13. (original) The material according to claim 3 in which the mesoporous metaloxide is mesoporous silica selected from the group consisting of MCM41, MCM48 and SBA type mesoporous silica.

14. (previously presented) The material according to claim 1 in which pore walls of the porous framework material are amorphous.

15. (previously presented) The material according to claim 1 in which pore walls of the porous framework material are crystalline.

16. (previously presented) The material according to claim 1 in which pore walls of the porous framework material are partially crystalline.

17. (previously presented) The material according to claim 1 in which pore walls of the porous framework material are periodically ordered.

18. (previously presented) The material according to claim 1 in which pores of the porous framework material are disordered.

19. (previously presented) The material according to claim 1 in which the porous framework material is an inverted opal.

20. (previously presented) The material according to claim 1 in which the pre-selected molecules are silsesquioxanes.

21. (Currently amended) The material according to claim 20 wherein the silsesquioxanes are selected from the group consisting of bis(triethoxysilyl)methane; 1,2-bis(triethoxysilyl)ethane, 1,2-bis(triethoxysilyl)ethylene; ~~1,4-bis(tirethoxysilyl)benzene~~ 1,4-bis(triethoxysilyl)benzene; 1,3-bis(triethoxysilyl)benzene; 1,3,5-tris(triethoxysilyl)benzene, and combinations thereof.

22. (previously presented) The material according to claim 1 in which pore walls of the porous framework material are partially covered by the pre-selected molecules.

23. (previously presented) The material according to claim 1 in which pore walls of the porous framework material are substantially completely covered by the pre-selected molecules.

24. (previously presented) The material according to claim 1 in which the pre-selected molecules bound to pore walls of the porous framework material are of a single type.

25. (previously presented) The material according to claim 1 in which the pre-selected molecules bound to pore walls of the porous framework material are of two or more different types.

26. (previously presented) The material according to claim 1 in which the pre-selected molecules bound to the pore walls to form at least one layer or multiple layers.

27. (previously presented) The material according to claim 1 in which the linkages between the framework and the pre-selected molecules are Si-O-Si linkages or Si-R-Si linkages.

28. (previously presented) The material according to claim 1 formed as a powder.

29. (previously presented) The material according to claim 1 formed as a film.

30. (previously presented) The material according to claim 1 formed as a monolith.

31. (Currently amended) A method of synthesizing a hybrid porous material having a porous framework material and pre-selected organic, organometallic, or biological

molecules chemically attached to a surface of pore walls of the porous framework through two or more chemical linkages, comprising the steps of:

a) preparing a porous framework material having pores and pore walls throughout with preselected porosity; and

b) chemically binding pre-selected organic, organometallic, or biological molecules to a surface of the pore walls of the porous framework material through two or more chemical linkages.

32. (Currently amended) The method according to claim 31 wherein the step of preparing a porous framework material includes synthesizing the porous framework material by mixing a particulate constituent of the framework material with a suitable supramolecular template under conditions suitable for self-assembly of the particulate constituent to form the framework material, and removing the supramolecular template ~~and the colloidal crystal~~.

33. (previously presented) The method according to claim 31 in which the framework material is a metaloxide.

34. (original) The method according to claim 33 in which the suitable supramolecular template is selected to give a porous framework material which is a mesoporous metaloxide.

35. (original) The method according to claim 33 in which the suitable supramolecular template is selected to give a porous framework material which is a macroporous metaloxide.

36. (original) The method according to claim 33 in which the suitable supramolecular template is selected to give a porous framework material which is a mesoporous-macroporous metaloxide.

37. (previously presented) The method according to claim 33 in which the metaloxide is silica.

38. (previously presented) The method according to claim 33 in which the metaloxide is selected from the group consisting of oxides of boron, magnesium, aluminum, gallium, indium, germanium, tin, titanium, zirconium, niobium, tantalum, molybdenum, tungsten and mixed metals.

39. (previously presented) The method according to claim 31 in which the framework material is an organometaloxide.

40. (original) The method according to claim 39 in which the suitable supramolecular template is selected so that the porous organometaloxide is a mesoporous organometaloxide.

41. (original) The method according to claim 39 in which the suitable supramolecular template is selected so that the porous organometaloxide is a macroporous organometaloxide.

42. (original) The method according to claim 39 in which the suitable supramolecular template is selected so that the porous organometaloxide is a mesoporous-macroporous organometaloxide.

43. (previously presented) The method according to claim 39, in which the organometaloxide is organosilica.

44. (Currently amended) The method according to claim [[40]] 34 in which the mesoporous metaloxide is mesoporous silica selected from the group consisting of MCM41, MCM48 and SBA type mesoporous silica.

45. (previously presented) The method according to claim 31 in which pore walls of the porous framework material are amorphous.

46. (previously presented) The method according to claim 31 in which pore walls of the porous framework material are crystalline.

47. (previously presented) The method according to claim 31 in which pore walls of the porous framework material are partially crystalline.

48. (previously presented) The method according to claim 31 in which pore walls of the porous framework material are periodically ordered.

49. (previously presented) The method according to claim 31 in which pores of the porous framework material are disordered.

50. (previously presented) The method according to claim 31 in which the porous framework material is an inverted opal.

51. (previously presented) The method according to claim 31 in which the pre-selected molecules are silsesquioxanes.

52. (Currently amended) The method according to claim 51 wherein the silsesquioxanes are selected from the group consisting of bis(triethoxysilyl)methane; 1,2-bis(triethoxysilyl)ethane, 1,2-bis(triethoxysilyl)ethylene; ~~1,4-bis(tirethoxysilyl)benzene~~ 1,4-bis(triethoxysilyl)benzene; 1,3-bis(triethoxysilyl)benzene; 1,3,5-tris(triethoxysilyl)benzene, and combinations thereof.

53. (previously presented) The method according to claim 31 in which pore walls of the porous framework material are partially covered by the pre-selected molecules.

54. (previously presented) The method according to claim 31 in which pore walls of the porous framework material are substantially completely covered by the pre-selected molecules.

55. (previously presented) The method according to claim 31 in which the pre-selected molecules bound to pore walls of the porous framework material are of a single type.

56. (previously presented) The method according to claim 31 in which the pre-selected molecules bound to pore walls of the porous framework material are of two or more different types.

57. (previously presented) The method according to claim 31 in which the pre-selected molecules bound to the pore walls to form at least one layer or multiple layers.

58. (previously presented) The method according to claim 31 in which the linkages between the porous framework material and the pre-selected molecules are Si-O-Si linkages or Si-R-Si linkages.

59. (previously presented) The method according to claim 31 including a step of forming the hybrid porous material as a powder.

60. (previously presented) The method according to claim 31 including a step of forming the hybrid porous material as a film.

61. (previously presented) The method according to claim 31 including a step of forming the hybrid porous material as a monolith.